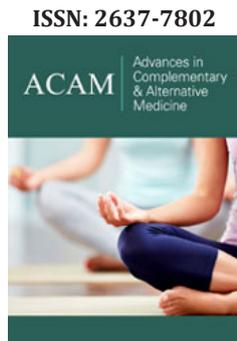


# Treatment of Urinary Incontinence in Women

Özlem Cinar Özdemir\* and Mahmut Sürmeli

The Faculty of Health Sciences, Physical Therapy and Rehabilitation, Turkey



**\*Corresponding author:** Özlem Cinar Özdemir, PhD, Assistant Professor, School of Physical Therapy and Rehabilitation, Turkey

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## Introduction

The International Continence Society defines urinary continence (UI) as any involuntary leakage of urine that is a condition being a social or hygienic problem. Incidence of UI increases with age, but it may shown at any age and is a common problem on worldwide. Whereas it is about 2-3 times more common in women, it effects a lot of men too. The prevalence of UI in middle-aged and older women varies between 30% to 60% ,and increases with age. The daily prevalence of UI changes from 5% to 15% but it rises to over 15% in women over age 70. Because of differences of populations, definitions and measurements the prevalence of UI demonstrate a wide variability among studies and it goes beyond the range that is stated above. Despite of the large prevalence, only from 7% to 12% effected people stated to this condition as a problem. There is a wide treatment options from surgical treatment to conservative modalities for UI. The purpose of this review to summarize of physiotherapy options in UI.

## Pelvic Floor Muscle Training

One of the most recommended approach for SUI, UUI and MUI is that of the pelvic floor muscle training (PFMT). The use of PFMT for UI treatment are referred to in ancient texts of the Chinese, Indians, Greeks and Romans. They believed that strengthening pelvic floor muscles (PFMs) also helped improve longevity, mental and sexual health. PFMT has entered the modern medical literature for the first time in 1936 when Margaret Morris defined the stretching and contracting of the PFMs as a protective and therapeutic approach for urinary and fecal incontinence. However, it was not until the efforts of Arnold Kegel in 1948 that the PFMT became popular in UI treatment and has been applied as a conservative treatment option ever since. In his article titled 'Progressive Resistance Exercise in the Functional Restoration of the Perineal Muscles', Kegel reports that he has successfully treated 64 patients with SUI. PFMT is primarily used in the treatment of the SUI and MUI patients with SUI symptoms and commonly employed in the pelvic organ prolapse (POP) and recommended as the first option. PFMT is also used in UUI, though not as often as in the case of SUI, MUI and POP.

The main purpose of the PFMT is to develop PFMs in terms of strength, endurance, coordination or any combination of these. It is suggested that the better-timed contraction helps prevent the reduction of urethra and bladder neck level against the increased intra-abdominal pressure. Through regular and repetitive exercise, muscles are hypertrophied, and the urethral resistance improves accordingly. Efficient muscle activity contracts the urethra against symphysis pubis and improves the urethral resistance. This way, it provides maximal support to the pelvic organs (especially the bladder neck and proximal urethra) and thereby elevates the position of the levator muscle and prevents urinary leakage by improving the hardness of the muscles and connective tissues and the muscle volume (hypertrophy) when or before the intra-abdominal pressure increases.

The prescribed exercise schedule may vary depending on the recommended positions to be adapted into the exercise that involve posture sitting, kneeling, standing, lying down etc. The recommended duration of the exercise may vary between 1 week to 6 weeks. But it is usually minimum 3 weeks. The recommended number of contractions in training sessions vary between 3 sets of 8-12 reps to 4 sets of 20reps. The NICE recommends 3 daily supervised sets of pelvic floor exercises with at least 8 contractions for at least 3 months.

The International Consultation Incontinence Committee, on the other hand, recommends a supervised training schedule of at least 8-12 weeks if no progress has been achieved with women with SUI during re-evaluation and a new approach is to be prescribed for them. It is believed that the intensity of contractions is more important than the frequency of the training itself.

PFMs can be activated along with abdominal muscles as well. There is plenty of evidence suggests that the active contraction of transverse abdominal muscle (TAM) is related with the coactivation of the PFMs. However, no study has yet demonstrated that the TAM contraction elevates the PFMs in every woman. For this reason, it is not as efficient as the direct contraction of the PFMs. Recent studies point out that the relationship between the PFMs and TAM is different depending on the relationship between the women with incontinence and women with continence. It is reported that the PFMs are displaced less frequently during the TAM contraction in women with SUI. It is established that this conservative treatment approach improves the symptoms and has no side effect. For this reason, it should be considered as the first treatment approach for women with UI issues.

### Vaginal Cones

PFMT is regarded as the first option in SUI treatment. However, other forms of treatment should be tried with patients that have difficulty in controlling such muscles or in adapting to the prescribed training. Vaginal cones (VCs) with gradually increasing weights are employed for this purpose. They provide progressive muscular overloading during the PFM strengthening exercises. VCs are placed inside the vagina and the patient is asked to hold those weighted cones inside her vagina as much as she can. If the patient has managed to hold the first cone placed in her vagina then she can gradually try the other cones with increased weight. The patient starts the exercise in upright standing position with the cones placed inside her vagina for at least one minute and then the duration and/or weight is gradually increased. The patient may even be asked to walk in that position in order to make the exercise more challenging. The objective for this exercise is to make patient walk for 20 minutes without losing the VCs. The effectiveness of VCs compared with no treatment or combined PFMT remains unclear (level 1).

### Mechanical Devices

Vaginal support prostheses have been in use for quite a long time. Although they are originally intended for POPs, they are also developed to be used in SUI as well. Such support devices provide mechanical support to the pelvic structure and urethra. The most important advantage of these devices is the fact that they can be applied to the vast majority of the incontinence population without requiring any specific test and that they have moderate side effects. On the other hand, such devices do not remedy the problem for good, and a surgical operation may be required if the condition gets worse. Moreover, such devices do not correct the ISD and are not beneficial in terms of UH. Most of patients opting for such devices believe that their condition does not warrant a surgical operation

and are relieved to use this particular minimal invasive method for the time being.

### Electrical Stimulation

Although PFMT is considered to be the most favourable option among the conservative treatment approaches, another treatment approach for this problem is the intra vaginal pelvic floor electrical stimulation (ES) devices. Such devices are known for their low side effects except for the cases of high intense irritation or burns. The mechanism of this treatment approach is based, on the one hand, on the activation of the detrusor inhibitory reflex through the reflex contractions of the electro stimulation and the triggering of hypertrophy in PFMs on the other hand. The purpose of using ES especially in the stress triggered UI conditions, such as the SUI patients, is to create an effect that will adequately support to prevent urinary leakage by efficiently contracting the PFMs when intra-abdominal pressure increases.<sup>33</sup> Reorganization of the spinal reflex and arrangement of cortical activity are considered to be important results of the electric stimulation. ES provides relaxation by inhibiting parasympathetic motor neurons. Transvaginal ES helps contract the PFMs and the number of activated muscles fibers are increased when contracted rapidly. This is to do with maintaining continence under stress. It also improves a person's awareness of the activity of such muscles. This way, the efficiency of voluntary contractions will also improve. ES covers supra pubical, transvaginal and sacral vertebral nerves. Electrodes can or cannot be implanted and it can be applied for a short or long duration. One of the ways of improving the efficiency of the PFMT is to combine it with ES. This way, a more efficient training program is created for the patient and better results are achieved.

### Biofeedback

Biofeedback is a technique that is intended to train patients to identify their PFMs, contract them in a proper manner and inhibit detrusor contractions. It uses measurement devices to help person to become aware of his/her body functions. The person may gain control over his/her bladder and urethral muscles by keeping diaries or using electronic devices to monitor the contractions of those particular muscle groups. SUI and UUI may be relieved by providing feedback through PFMT and ES. Biofeedback uses external sensors to evaluate the bodily process through changeable measurements. Although biofeedback is not a treatment method on its own, it can nevertheless be used in combination with the PFMT by displaying the activities of muscles when resting, contracting and relaxing. Moreover, a person's PFMs strength during contractions can be shown through a series of methods such as electromyogram.

### Magnetic Stimulation

Magnetic stimulation (MS) has been in use in UI treatment since 1998 and considered to be a new conservative treatment approach approved by the United States Food and Drug Administration. Advantages of the MS include that it does not require probes, skin contact or any physical or electrical contact with the skin surface and can be applied when the person is dressed. Some authors suggest that the stimulation of the PFMs in SUI leads to external

sphincter contraction and increasing the maximal urethral closure pressure.

### Alternative Exercises

In addition to conservative treatment options mentioned above, there are some alternative exercises doing as an alternative or an addition to pelvic floor muscle training. These include training of the deep abdominal muscles, Pilates exercise, yoga, Tai Chi, breathing exercises, posture and general fitness training.

### Conclusion

The medical treatment of current therapies for incontinence ranges from conservative to medical therapy to invasive surgical options. The first choice in the conservative treatment of incontinence should be pelvic floor muscle training. Other treatment methods may also be used as a supplement. Physiotherapists should have a good understanding of the mechanisms of incontinence in order to perform appropriate treatment. Further studies on conservative therapies should be undertaken.

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